

Wortmannin

Autophagy Inhibitor; PI3K Inhibitor

Catalog code: tlr1-wtm

<https://www.invivogen.com/wortmannin>

For research use only

Version 22J11-MM

PRODUCT INFORMATION

Contents

- 5 mg of Wortmannin

Storage and stability:

- Wortmannin is provided as a translucent film and shipped at room temperature. Upon receipt, store at -20°C. Wortmannin is light sensitive. Protect from light.
- Upon resuspension in DMSO, prepare aliquots of Wortmannin and store at -20°C. Wortmannin resuspended in DMSO is stable for 3 months when properly stored. Avoid repeated freeze-thaw cycles.

Quality control:

- Purity: ≥95% (LC).
- The absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and HEK-Blue™ TLR4 cells.

DESCRIPTION

Wortmannin is a fungal metabolite that acts as a potent and selective inhibitor of phosphatidylinositol 3-kinase (PI3K)¹. PI3K is a key molecule in the initiation of signal transduction pathways. It is important to nearly all aspects of cell biology such as proliferation, differentiation, and translation. Indeed, dysregulation of PI3K activity has been implicated in a broad range of human diseases, such as cancer and immune disorders. This family of enzymes is divided into three different PI3K classes (I, II, and III) which exhibit non-redundant functions in cells². Wortmannin is considered to be a pan-PI3K inhibitor targeting both PI3K class I and class III indiscriminately, while PI3K class II are less sensitive to wortmannin³. Specifically, it irreversibly inhibits PI3K class III, while its effects on PI3K class I are transient⁴. Wortmannin is widely used as an autophagy inhibitor based on its inhibitory effect on class III PI3K activity^{4,5}. Specifically, Wortmannin binds to the ATP active site and induces a conformational change in the catalytic domain⁶. Notably, Wortmannin is able to suppress autophagy regardless of nutrient status, unlike other autophagy inhibitors⁵.

1. Arcaro A. & Wymann MP., 1993. Wortmannin is a potent phosphatidylinositol 3-kinase inhibitor: the role of phosphatidylinositol 3,4,5-trisphosphate in neutrophil responses. *Biochem J.* 296:297-301. 2. Jean S. & Kiger A.A., 2014. Classes of phosphoinositide 3-kinases at a glance. *J Cell Sci.* 127(5): 923-8. 3. Domin J. et al., 1997. Cloning of a human phosphoinositide 3-kinase with a C2 domain that displays reduced sensitivity to the inhibitor wortmannin. *Biochem J.* 326(Pt1): 139-47. 4. Wu Y.T. et al., 2010. Dual Role of 3-Methyladenine in Modulation of Autophagy via Different Temporal Patterns of Inhibition on Class I and III Phosphoinositide 3-Kinase. *J Biol Chem.* 285(14):10850-61. 5. Blommaert E.F. et al., 1997. The phosphatidylinositol 3-kinase inhibitors wortmannin and LY294002 inhibit autophagy in isolated rat hepatocytes. *Eur. J. Biochem.* 243:240-6. 6. Walker E.H. et al., 2000. Structural determinants of phosphoinositide 3-kinase inhibition by wortmannin, LY294002, quercetin, myricetin, and staurosporine. *Mol Cell.* 6(4):909-19. 7. Hazeki K. et al., 2006. Opposite effects of wortmannin and 2-(4-Morpholinyl)-8-phenyl-1(4H)-benzopyran-4-one Hydrochloride on Toll-Like Receptor-mediated Nitric Oxide Production: Negative Regulation of Nuclear Factor- κ B by Phosphoinositide 3-Kinase. *Mol. Pharmacol.* 69:1717-4. 8. Ng S.S. et al., 2001. Wortmannin inhibits pkb/akt phosphorylation and promotes gemcitabine antitumor activity in orthotopic human pancreatic cancer xenografts in immunodeficient mice. *Clin Cancer Res.* 7(10):3269-75.

CHEMICAL PROPERTIES

CAS number: 19545-26-7

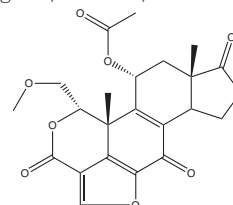
Synonym: KY 12420

Formula: C₂₃H₂₄O₈

Molecular weight: 428.4 g/mol

Solubility: 10 mg/ml (46.7 mM) in DMSO

Structure:



METHODS

Preparation of stock solution at 20 mM

1. Add 584 μ l of DMSO.
3. Vortex until completely dissolved.
4. Once Wortmannin has been dissolved in DMSO, it can be used immediately or stored at -20°C for 3 months.
5. Prepare further dilutions using sterile water or culture medium. We do not recommend storing aqueous solutions for more than one day.

Working concentration: 20 nM-1 μ M (for cell culture)

PROTOCOLS

For reference only; as described in the indicated publications.

Cell Culture Assay⁵

Cell type: Rat hepatocytes

Working concentration: 20 nM-1 μ M

Method: Electron microscopy to study autophagosome formation

Cell Culture Assay⁷

Cell type: Human macrophages

Working concentration: 100 nM-1 μ M

Method: ELISA, RT-PCR, and Western blot

Animal Study⁸

Animal model: Mice

Dose: 0.175, 0.35, or 0.7 mg/kg

Administration: Intravenous bolus injection

RELATED PRODUCTS

Product	Description	Cat. Code
Bafilomycin A1	Autophagy inhibitor	tlr1-baf
3-Methyladenine	PI3K inhibitor	tlr1-3ma
Rapamycin	mTOR inhibitor	tlr1-rap

TECHNICAL SUPPORT

InvivoGen USA (Toll-Free): 888-457-5873

InvivoGen USA (International): +1 (858) 457-5873

InvivoGen Europe: +33 (0) 5-62-71-69-39

InvivoGen Asia: +852 3622-34-80

E-mail: info@invivogen.com

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